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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,738	03/30/2001	Ichiro Morishita	053933-5008	5464

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MORGAN LEWIS & BOCKIUS LLP
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WASHINGTON, DC 20004

EXAMINER

PATEL, GAUTAM

ART UNIT	PAPER NUMBER
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2655

18

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/821,738

Applicant(s)

MORISHITA ET AL.

Examiner

Gautam R. Patel

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment:

1. This is in response to amendment filed on 3-2-04 (Paper # 9).
2. Claims 1-8 remain for examination.

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Robinson et al., US. patent 5,973,817 (hereafter Robinson), in view of Kulishov, US. patent 6,353,690 (hereafter Kulishov).

As to claim 1, Robinson discloses the invention as claimed [see Figs. 7-18, especially 7-10], a dynamic control diffraction grating and a voltage-dependent phase varying material, comprising:

a voltage-dependent phase varying material [the liquid crystal] for transmitting a beam of light therethrough and varying the phase of the transmitted light beam in response to external voltages applied thereto, said voltages having different levels and being applied to said phase varying material at regular intervals In a comb form [col. 8, line 48 to col. 9, line 16];

Robinson discloses all of the above elements, including a voltage-dependent phase varying material and comb form of two opposing electrodes. Robinson does not specifically disclose that these opposing electrodes can be interdigitated with each other

However, application and use of interdigitated electrodes is well known in the art for a long time. Also Kulishov clearly discloses:

That the comb form electrodes that includes two opposing electrodes interdigitated with other [col. 2, 27-56 and col. 4, lines 19-46].

Both Robinson and Kulishov are interested in improving polarization and filtering characteristics of the diffraction grating.

One of ordinary skill in the art at the time of invention would have realized that it would be advantageous to control two or more characteristics in a diffraction grating at the same time in system of Robinson, thus saving components and making design more efficient.

Therefore, it would have been obvious to have used an interdigitated comb like structure in the system of Robinson as taught by Kulishov because one would be motivated to provide control of a diffraction grating where both refractive index and the spatial periodicity may be electrically adjusted at the same time.

5. As to claims 2 and 6, Robinson discloses:
said voltage-dependent phase varying material is liquid crystal [col. 8, lines 48-58].
6. As to claims 3 and 7, Robinson discloses:
wherein said voltage-dependent phase varying material is a refractive index varying material for varying said phase of said transmitted light beam with a variation in its refractive index responsive to said first and second voltages [col. 7, line 39 to col. 8, line 2 and col. 8, lines 25-38].
7. As to claims 4 and 8, Robinson discloses:

said refractive index varying material is lithium niobate [col. 11, lines 42-44].

8. As to claim 5, Robinson discloses:

a voltage-dependent phase varying material [the liquid crystal] for transmitting a beam of light there through and varying the phase of the transmitted light beam in response to first and second voltages applied thereto;

a first transparent electrode [fig. 7, unit 13] attached to one inner surface of a flat glass panel for applying said first voltage to said phase varying material, said glass panel containing said phase varying material, said first transparent electrode including a plurality of combs arranged at regular intervals [col. 8, line 48 to col. 9, line 16 and col. 9, lines 35-63]; and

a second transparent electrode [fig. 7, unit 15] attached to the other inner surface of said glass panel for applying said second voltage to said phase varying material, said second transparent electrode including a plurality of combs arranged at regular intervals [col. 8, line 48 to col. 9, line 16 and col. 9, lines 35-63 and figs. 7-10];

Robinson discloses all of the above elements, including a voltage-dependent phase varying material and comb form of two opposing electrodes. Robinson does not specifically disclose that these opposing electrodes can be interdigitated with each other

However, application and use of interdigitated electrodes is well known in the art for a long time. Also Kulishov clearly discloses:

That the comb form electrodes that includes two opposing electrodes interdigitated with other [col. 2, 27-56 and col. 4, lines 19-46].

Both Robinson and Kulishov are interested in improving polarization and filtering characteristics of the diffraction grating.

One of ordinary skill in the art at the time of invention would have realized that it would be advantageous to control two or more characteristics in a diffraction grating at the same time in system of Robinson, thus saving components and making design more efficient.

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Therefore, it would have been obvious to have used an interdigitated comb like structure in the system of Robinson as taught by Kulishov because one would be motivated to provide control of a diffraction grating where both refractive index and the spatial periodicity may be electrically adjusted at the same time.

Robinson and Kulishov were sent in the previous action dated 12-5-03.

9. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new grounds of rejection.

10. Applicant's amendment necessitated the new grounds of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P.

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gautam R. Patel whose telephone number is (703) 308-7940. The examiner can normally be reached on Monday through Thursday from 7:30 to 6.

The appropriate fax number for the organization (Group 2650) where this application or proceeding is assigned is (703) 872-9314.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Doris To can be reached on (703) 305-4827.

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Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is (703) 305-4700 or the group Customer Service section whose telephone number is (703) 306-0377.

A handwritten signature in black ink, appearing to read "Gautam R. Patel", with a long horizontal line extending from the end of the signature.

Gautam R. Patel
Primary Examiner
Group Art Unit 2655

March 29, 2004